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(54) Abstract Title
Glove containing electromagnetically detectable particles

(57) A glove produced from a polymeric material contains an evenly dispersed quantity of electromagnetically detectable particles which may be in powder form. The electromagnetically detectable may be a ferrous material. The glove may be produced by mixing the powder with a liquid platisol to produce a relatively homogeneous mix where the powder or particles represents between 3-6% of the mix.

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The claims were filed later than the filing date but within the period prescribed by Rule 25(1) of the Patents Rules 1995.

This print takes account of replacement documents submitted after the date of filing to enable the application to comply with the formal requirements of the Patents Rules 1995

GLOVES

This invention relates to gloves and more especially to gloves whose presence can be detected electro-magnetically.

The wearing of gloves by operatives in manufacturing industries, such as pharmaceutical, food and tobacco industries, is important to protect products from contamination and to preserve the required high standards of hygiene and cleanliness. A consequence of this is that a glove or a relatively small piece of a glove caused, for example, by the glove snagging or being torn, will become detached from an operative's glove and be mixed with products being manufactured.

To meet this problem, it is accepted practice that operatives' gloves should be coloured blue and it is now a requirement in many countries that this procedure be followed so that gloves can be detected visually. Visual detection is not foolproof, particularly where small glove pieces are concerned.

Electro-magnetic inspection of products leaving a production line is undertaken as a matter of course in many industries. Such inspections enable metal-based foreign bodies present in otherwise non-metallic products to be detected. In this way, contaminated products can be discarded. Operatives' gloves are generally produced from a polymeric substance (e.g. a plastisol) and their presence in a product would not at present be detected other than by visual inspection.

One object of the present invention is to provide a glove for use by operatives on, for example, manufacturing production lines which can be detected electro-magnetically in the event that it or a part thereof becomes mixed with products during the manufacturing process.

According to the present invention in one aspect, there is provided a glove produced from a polymeric material containing an evenly dispersed quantity of electro-magnetically detectable particles.

The polymeric material may be a plastisol such a natural latex, acrylonitrile-butadiene (nitrite) or polyvinylchloride (pvc). Typically, the gloves are produced by a process in which a glove-shaped former is immersed for a relatively short period of time in a solution of the polymeric material. The solution may also include various additives such as stabilisers, accelerators and fillers. To produce a single glove, the former may be sequentially immersed two or more times.

In another aspect, there is provided a glove which includes an evenly dispersed quantity of a magnetically detectable material in powder form.

The electro-magnetically detectable material is preferably in powder form, the average particle size of the powder preferably being between 1 and 200 microns. Typically, the average particle size is in the range 50 to 200 microns, preferably between 50 and 100 microns.

The electro-magnetically detectable material is preferably a ferrous material, more preferably ferrous oxide (Fe_3O_4). The material may consist solely of a single metallic substance (e.g. Fe_3O_4) or it may comprise a mixture of two or more different electro-magnetically detectable materials including an iron-containing powder. Alternatively, the material may comprise a bronze alloy of copper with aluminium, manganese or beryllium. The alloy may be an alloy of copper and tin and may include other metals such as zinc or lead.

The electro-magnetically detectable powder is preferably mixed with the liquid plastisol to produce a relatively homogenous mix and the quantity of powder added preferably represents between 1% and 3% by weight of the mix. Typically, the quantity is of the order of 2% by weight. Homogenous distribution of the electro-magnetically detectable material allows even small fragments of a glove to be detected with conventional electro-magnetically operating detection equipment.

When the electro-magnetically detectable material is in powder form, then its type and particle size is preferably such as to be detectable in the frequency range 50 kHz to 600 kHz, which is a frequency range that is employed by conventional detection equipment. As

mentioned, the particle size of the majority of the powder is preferably below 200 microns, and would usually be above 1 micron. More preferably the particle size of the majority of the powder is in the range 50 to 200 microns and most preferably it is in the range 50 to 100 microns.

In use, the intimate presence of the electro-magnetically detectable powder within the glove material is sufficient to activate conventional detection equipment in the event that a glove or a relatively small part of a glove is present in manufactured products leaving a production line.

It will be appreciated that the foregoing is merely exemplary of gloves in accordance with the invention and that modifications can readily be made thereto without departing from the true scope of the invention.

CLAIMS

1. A glove produced from a polymeric material containing an evenly dispersed quantity of electromagnetically detectable particles.
2. A glove as claimed in Claim 1 wherein the polymeric material is a plastisol, natural latex, acrylonitrile-butadiene or polyvinylchloride.
3. A glove as claimed in Claim 2 which the plastisol is natural latex, acrylonitrile-butadiene or polyvinylchloride.
4. A glove which includes an evenly dispersed quantity of a magnetically detectable material in powder form.
5. A glove as claimed in Claim 4 wherein the electro-magnetically detectable material is in powder form, the average particle size of the electro-magnetically detectable powder is between 1 and 200 microns.
6. A glove as claimed in Claim 5 wherein the average particle size is in the range 50 to 200 microns.
7. A glove as claimed in Claim 6 wherein the average particle size is in the range of 50 and 100 microns.
8. A glove as claimed in any one of the preceding claims wherein the electro-magnetically detectable material includes a ferrous material.
9. A glove as claimed in Claim 8 wherein the ferrous material is an oxide of iron.
10. A glove as claimed in Claim 9 wherein the material is ferrous oxide.

11. A glove as claimed in Claim 8 wherein the material comprises a mixture of two or more different electro-magnetically detectable materials.
12. A glove as claimed in any one of claims 1 to 7 wherein the electro-magnetically detectable material comprises a bronze alloy of copper with aluminium, manganese or beryllium.
13. A glove as claimed in Claim 12 wherein the alloy is an alloy of copper and tin.
14. A method of producing a glove as claimed in any one of the preceding claims wherein the electro-magnetically detectable powder is mixed with a liquid plastisol to produce a relatively homogenous mix and the quantity of electromagnetic powder or particles added to the liquid plastisol represents between 3% and 6% by volume of the mix.
15. A method as claimed in Claim 14 wherein the quantity is of the order of 6% by volume.

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INVESTOR IN PEOPLE

Application No: GB 0105797.5
Claims searched: 1-15

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Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

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Other: Online: WPI, EPODOC, JAPIO

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X	EP 0599231 A	(HOECHST CELANESE CORP) see abstract	1,4,5,8,14 &15
X	WO 9966253 A	(HUET ET AL) see abstract	1&4-7
X	US 5922482 A	(HUTCHINSON) see abstract	1-15
X	US 5215701 A	(GOULD) see abstract	1-5,8-11, 14&15
X	US 3916448 A	(HAMEL) see abstract	1&4

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.